



The line-up in Round Two from left: Zoal, Happy Camper, Rid-X, Raritan C.P., Odorlos, Raritan KO, and BaTANK 3.

WHAT WE TESTED

Our previous test looked at many of the big players in the recreational vehicle market. This time, we included products from smaller companies, those recommended by our readers, and those developed for home septic systems. We only included one product from our previous test, Yara Chemical's Odorlos, which we used as a control.

Two familiar manufacturers in this round are Raritan, the New Jersey-based maker known for its marine toilet systems, and the Southern California-based Forespar, a longtime player in the marine market. Other contenders included Happy Camper, which as the name implies, is geared toward the camping market; Rid-X, a familiar septic tank product; and Zoal No-Flex, a chemical powder recommended by a *Practical Sailor* reader.

HOW WE TESTED

For the test, we created a series of small holding tanks containing real sanitary waste. The sanitary waste was supplied by a 20-pound iguana named "Ziggy." (Ziggy typically poops in a tray of water, and we knew the mixture to be plenty foul.) This was supplemented with additional sanitary waste during the start-up period each spring. Seawater flush was used, as the odor problems associated with seawater are known to be more severe (the result of bacteria-reducing sulfate into more odorous sulfide chemicals). Tank tests were supplemented with field testing aboard a boat on Chesapeake Bay.

There is only one true measure of effectiveness: whether the vent stinks when the head is flushed. Since calibrating noses presents certain challenges, it's nice to have an analytical number to compare as well. A hydrogen sulfide monitor (the type used to test sewer gas) was used to back-up our sniff testing. At regular intervals, testers gave each sample a sniff rating in addition to recording the hydrogen sulfide levels.

Fighting Odor with Chemicals Part II

More anti-odor agents make the grade, but having a well-ventilated holding tank is key.

Last summer, our testers investigated holding tank chemicals ("Fighting Odor with Chemical Additives" *PS*, February 2012) in concert with ongoing investigations of sanitation hoses and holding-tank vent filters. We investigated some old-school deodorizing products with disappointing results, but we also tested the latest generation of holding tank treatments, those using enzymes, nutrients for bacteria, and live bacteria to kill odors by more natural—and often more effective—means. Our readers quickly responded, suggesting we look at some of their personal favorite products, so that's what this test is about.

Talk about holding tank chemicals, and many sailors think of that familiar port-a-potty smell—disinfectants and surfactants mixed with deodorizers. And yes, these products are still being used in holding tanks, usually by those who don't know any better. Some chemicals also claim to help liquefy the waste and prevent clogging. While larger boats can use vent filters (*PS*, March 2012) and enhanced ventilation to reduce odors, the only prac-

tical option for the small-boat owner with a portable toilet is some sort of treatment in a can.

The newer, enzyme-loaded products are known as bio-augmentation treatments, because they supplement the natural biological processes. Some work primarily by providing nitrate as both a nutrient and as an alternative oxygen source for bacteria. Bacteria convert nitrate to nitrite or nitrogen, liberating oxygen and encouraging aerobic decomposition.

Several products claim to contain live bacteria to aid in "digestion," but in our last test, we were unable to develop cultures. This time around, however, we did get a culture on some products, and one of these, Bactank T3, turned out to be one of the most effective.

In the end, the complex chemistry and shifting nature of holding tank conditions make it difficult to pinpoint all of the chemical processes at work. Given the variables that can impact this particular test, the best we could do is measure what we find and add a little growth-fostering air to the biologically active treatments.